embodiment, the selected distance is about 1 to 2 cm. The indicator 122 is mounted to the housing 108 at a first location, and the retainer 130 is mounted to the housing at a second location.

In the event that the housing 108 is distorted even temporarily in a low speed event such that the first and second locations approach one another by more than the selected distance of overlap between the lip 128 and the retainer 130, then the indicator 128 moves out of engagement with the retainer 130, and the spring 132 moves the indicator 122 to the upper position shown in FIG. 11.

A maintenance inspector can readily determine if any of the energy absorbing elements 22 has been compressed excessively simply by looking for indicators 122 in the extended position. This can be done at a considerable distance, and does not require close inspection.

Of course, many alternatives to the indicator 122 are possible. For example, the spring does not have to be a separate element, and the desired biasing force can be obtained by bending of the indicator 122 itself. Furthermore, the zone of increased compressibility can be formed with many geometries, and corrugations are not always required. If desired, the retainer 130 can engage the indicator 122 along the side rather than the end of the indicator 122. Furthermore, the indicator can move between the first and second positions with translational rather than pivoting movements.

Conclusion

From the foregoing detailed description it should be apparent that an improved crash cushion has been described. The central guide rail reduces vehicle snagging and simplifies installation while providing excellent rigidity against lateral movement and controlled axial collapse. The improved diaphragm assembly utilizes recessed legs that again reduce vehicle snagging. These assemblies are rigid, and are designed to lock against the guide rail in a lateral impact. The improved fender panels are stronger, with an improved cross-sectional shape that increases pull out resistance and enhances a controlled axial collapse. The tapered trailing edge further reduces vehicle snagging in a wrong-way collision. The energy absorbing element indicator indicates remotely to a maintenance inspector that the element has been compressed and possibly damaged, and is therefore in need of replacement.

Of course, it should be understood that a wide range of changes and modifications can be made to the preferred embodiment described above. It is therefore intended that the foregoing detailed description be considered as illustrative and not as limiting. It is the following claims, including all equivalents, that are intended to define the scope of this invention.

We claim:

1. In a highway crash cushion of the type comprising an array of diaphragms, a plurality of energy absorbing elements disposed between the diaphragms, and an array of fender panels extending alongside the diaphragms, the improvement comprising:

a single rail disposed under the crash cushion and anchored to a support surface;

a plurality of guides, each coupled to a respective one of the diaphragms and substantially centered with respect to the respective diaphragm;

said guides mounted on the rail to slide along the rail and to restrict movement of the respective diaphragms with respect to the rail in both lateral directions;

said rail substantially centered with respect to the diaphragms;

at least some of the diaphragms each coupled to a respective leg assembly extending beneath the respective diaphragm on both sides of the rail to support the diaphragm on a support surface.

2. The invention of claim 1 wherein the rail comprises a plurality of interconnected rail segments.

3. The invention of claim 1 wherein the rail comprises first and second flanges, and wherein the guides extend under the flanges to prevent excessive upward movement of the diaphragms with respect to the rail.

4. The invention of claim 1 further comprising:

a plurality of leg assemblies, each leg assembly comprising an upper portion mounted to a respective one of the diaphragms, a lower portion, two side portions, and a centerline extending between the side portions;

each said lower portion connected to two feet shaped to support the respective leg on a support surface;

said feet extending outwardly from the respective leg assembly, away from the centerline, such that the feet are separated from the respective centerline by a maximum distance D_F, the side portions are separated from the respective centerline by a maximum distance D_L, and the ratio D_F/D_L is greater than 1.1.

5. The invention of claim 4 wherein the ratio D_F/D_L is greater than 1.4.

6. The invention of claim 4 wherein the ratio D_F/D_L is greater than 1.8.

7. The invention of claim 1 further comprising:

a plurality of leg assemblies, each leg assembly comprising an upper portion mounted to a respective one of the diaphragms, a lower portion, two side portions, and a centerline extending between the side portions;

each said lower portion connected to two feet shaped to support the respective leg on a support surface;

said feet extending outwardly from the respective leg assembly, away from the centerline, such that the feet are separated from the respective centerline by a maximum distance D_F, the side portions are separated from the respective centerline by a maximum distance D_L, and the difference D_F-D_L is greater than 4 cm.

8. The invention of claim 7 wherein the difference D_F-D_L is greater than 8 cm.

9. The invention of claim 7 wherein the difference D_F-D_L is greater than 12 cm.

10. The invention of 4 or 7 wherein each foot angles downwardly and outwardly from the respective leg assembly.

11. The invention of claim 4 or 7 wherein each foot comprises a side plate adjacent a lower portion of the respective foot, each side plate extending outwardly and downwardly from the respective foot to create a ramp extending transversely to the respective diaphragm.

12. The invention of claim 4 or 7 wherein each leg assembly comprises a respective one of the guides centered on the centerline, each said guide comprising a first pair of spaced plates facing the centerline on one side of the centerline and a second pair of spaced plates facing the centerline on the other side of the centerline.

13. The invention of claim 1 wherein each leg assembly extends on both sides of the rail such that the leg assembly extends laterally outwardly of all of the respective guide and laterally outwardly of all of the rail.

14. The invention of claim 1 wherein each leg assembly comprises two legs, each leg extending on a respective side

of the rail such that the legs extend laterally farther from a centerline aligned with the rail than both the guides and the rail.

15. The invention of claim 1 wherein each leg assembly comprises two legs arranged such that all of the rail and the respective guide are disposed between the legs.

16. The invention of claim 1 wherein at least a forward portion of the crash cushion is freestanding.

17. In a highway crash cushion of the type comprising an array of diaphragms, a plurality of energy absorbing elements disposed between the diaphragms, and an array of fender panels extending alongside the diaphragms, the improvement comprising:

a single rail disposed under the crash cushion and anchored to a support surface;

a plurality of guides, each coupled to a respective one of the diaphragms and substantially centered with respect to the respective diaphragm;

said guides mounted on the rail to slide along the rail and to restrict movement of the respective diaphragms with respect to the rail in both lateral directions;

said rail substantially centered with respect to the diaphragms;

wherein the rail comprises a plurality of interconnected rail segments;

wherein each rail segment forms a central protrusion at one end and a central recess at the other end, and wherein the protrusion of one rail segment is received within the recess of an adjacent rail segment.

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add A7 add B1